

The Derivative Function – Class Notes

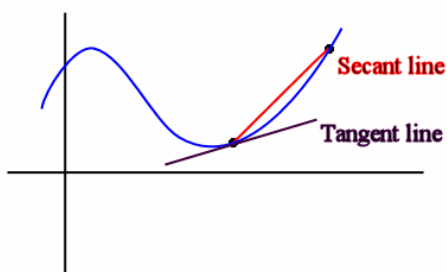
As mentioned in prior classes, calculus is the mathematical study of change.

Defining the Derivative

- The derivative of a function is still a function.

Explain:

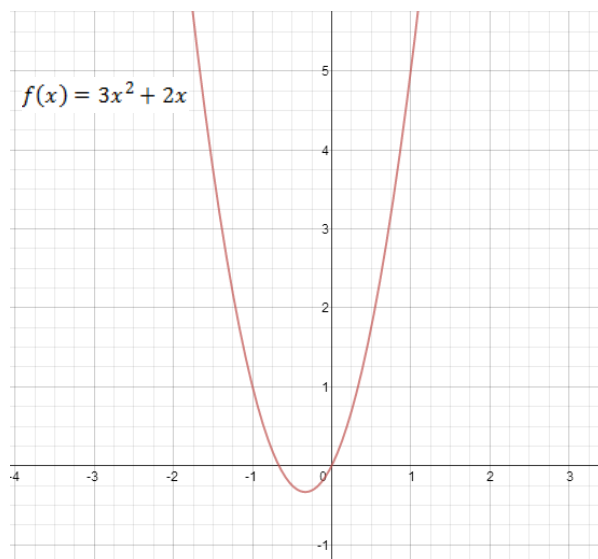
- The derivative of a function is a slope of a tangent line to the graph at any point on the graph.



By definition, the **derivative of f at the number a** is given by $f'(a) = \lim_{h \rightarrow 0} \frac{f(a+h) - f(a)}{h}$, provided that this limit exists.

Derivative **notation**:

Example: Find the slope of a tangent line to the graph of $f(x) = 3x^2 + 2x$ at $x = 1$ and $f(x) = x$.



Elbow Partner Activity

Find the derivative of $f(x) = 3x^2 + 2x$ at $x = 1$.